A gender perspective into the potential to enhance livestock productivity through improved feeding in Haleku, Adami Tullu District, East Shewa, Ethiopia

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Contents

Contents

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Introduction

Livestock production plays a significant role in the livelihoods of households in rural areas of Ethiopia. The poor performance of the livestock sector in the country has been related to various reasons such large livestock numbers, poor quality of breeds, insufficient amount of good quality feeds and seasonal variation in there availability, poor health of livestock and inadequate health services, inefficient management of livestock, poor infrastructure, poor marketing and credit facilities, inadequate knowledge of integrated mixed farming system and inability of the farmers to exploit this resource due to different priorities.

The Feed Assessment Tool (FEAST) is a systematic method to assess local feed resource availability and use. It offers a systematic and rapid methodology to assess feed resources at site level with a view to developing a site-specific intervention strategy to improve and optimize feed supply, utilization and animal production through technical or organizational interventions. FEAST differs from conventional feed assessment approaches that focus on the feeds, their nutritive value, and ways to improve it. FEAST broadens this assessment to account for the importance of livestock in local livelihoods, the relative importance of feed problems locally, and the local situation related to labour, input availability, credit, seasonality, and markets. This tool was used to characterize the farming and livestock production system including feed resources and related aspect of small holder farmers in Adami Tulu district of East Shewa zone in Oromia Ethiopia.

The feed assessment study was conducted in June 2015 by researchers from Adami Tulu Agricultural Research Center with backstopping from the International Center for Agricultural Research in Dry Areas (ICARDA).

The objective of the study was to establish the perceptions of men and women smallholder farmers to major livestock production challenges, opportunities and possible potential interventions with special emphasis on livestock feed and related aspects for the improvement of livestock production and productivity in the *Adami* Tulu district.

Methodology

Study site

Adami Tullu Jido Kombolcha (ATJK) district in East Shewa is a targeted action site of the CRP-Dryland Systems representing intensive rain fed systems in which intensification is the focus. Haleku Gulenta peasant association (kebele) is located in ATJK, a distance of 12 km from Ziway Town, the administrative center of the District. It lies 10.26°N, 39.64°E at an altitude of 1645 m.a.s.l. It has a minimum and maximum temperature of 10◦C and 31◦C respectively and receives average annual rainfall of 720 mm.

Sampling method

Adami Tullu was selected on the basis of representativeness of the action site and scalability of results to other areas, interest of communities to participate, presence of a national/regional research station in proximity and access to the market. Haleku was selected on the basis of accessibility.

Livestock keepers were selected using a criteria based on gender, age and wealth classes according to land holdings.

Survey structure and format

Two tools were used for the survey. The Participatory Rural Appraisal approach was used to conduct two group discussions, each comprising exclusively men or women. A total of 12 men and 10 women participated. The group discussions yielded qualitative data on agricultural production systems and feed resource availability and utilization. Nine farmers from each group were interviewed individually and yielded quantitative data on crops grown, income sources, feed availability and seasonality. The surveys were conducted

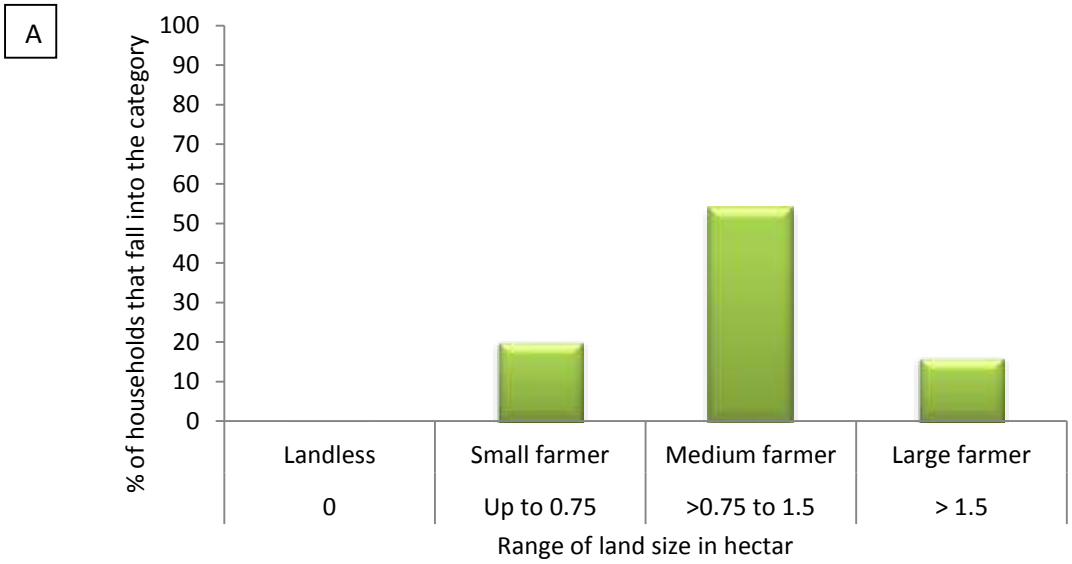
Data analysis

Narrative reports collected from individual *men* and *women* group discussions within each *kebele* were initially examined separately, later compared and then reported. Individual interview results were analyzed using the FEAST excel temple (www.ilri.org/feast).

Major findings

Overview of the farming system

The farming system in Haleku is classified as a mixed crop-livestock production system, with a predominance of crops. Farm land size varies among the households. Depending on the land holding size, farmers in the *kebele* were classified into four classes of landless, small, medium and large (Fig. 1), whereby majority of farmers lie in the medium range of land holding as mentioned by both men and women. The average land holding in the study *kebele* is 1.2 hectares per household. There are no landless farmers according to the respondents. Although different estimates of land size were given by men and women, both groups categorized most farmers as owners of medium-sized land. Farmers reported a decreasing land holding size per family which can be related to increased land fragmentation due to a larger family sizes over the years. The average family size is estimated as 12.



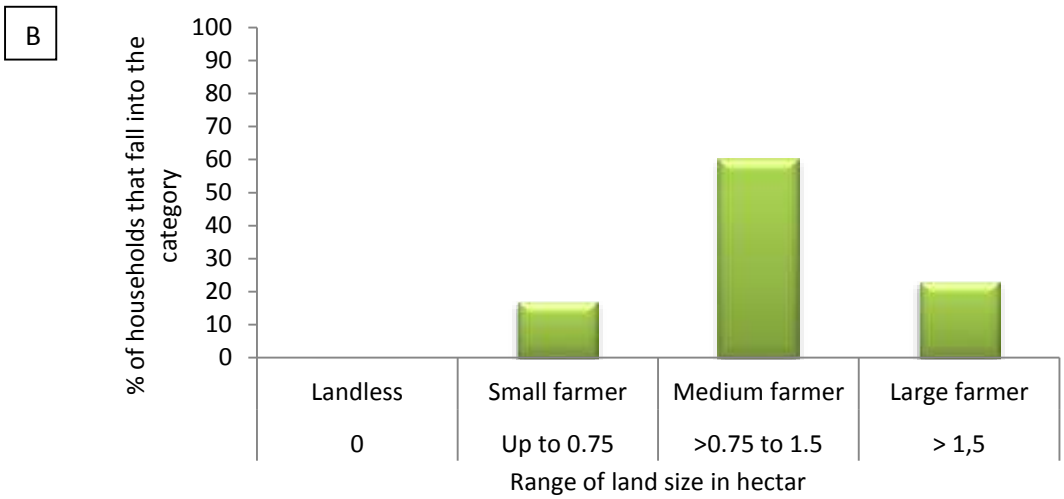


Figure 1: Proportion of farmers in different ranges of land size according to women (A) and male (B)

Farmers in the study *kebele* indicated that there is only one rain-fed cropping season namely *kiremt*. The *kiremt* season occurs from May to November. Activities in each cropping season include planting up to harvesting. There is no fallowing practice. 24% of the 560 households have access to furrow irrigation. Onions, tomatoes, maize, green paper, potatoes and green beans are grown. The rainfall pattern over twelve months of the year 2014 was scored by the farmers. The score was given on a scale of 0-5, where 5 = excess, 4 = high, 3 = medium, 2 = low, 1 = very low and 0 = no rain. Table 2 shows that high rainfall occurs between June to August.

Table 1: Rainfall score given by farmers from Haleku *kebele*

Kebele	Month											
	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Women	0	0	0	1	2	3	5	5	2	1	0	0
Men	0	0	1	2	3	4	5	5	3	1	0	0

Labour is mainly from the family, shortage is not a problem with regard to the needs for agricultural activity. 60% of the families can afford hired labour. Male daily laborers earn between 50-70 ETB per day. Women tend to earn less, an average of 60 ETB because they do not plough. They undertake other activities like weeding and harvesting which pay less.

Major crops grown in the study areas include maize, wheat, tef, and green beans as soon in Fig. 2. Perceptions of men and women were relatively the same although women tended to estimate higher with maize and wheat. Agricultural inputs and materials related to crop production such as seeds and fertilizers are readily available for the farmers to buy.

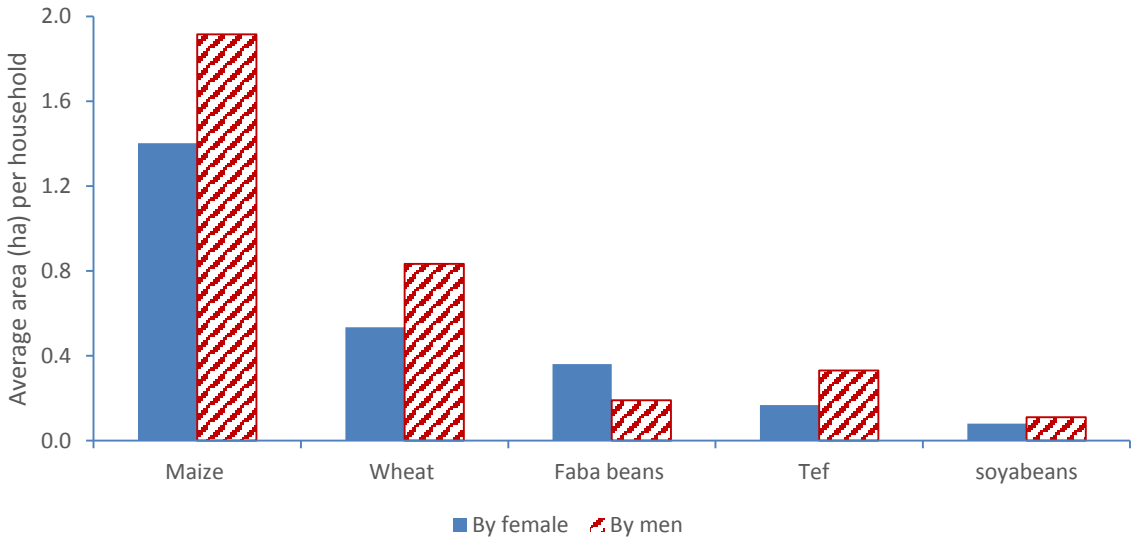


Figure 2: Major crops grown and average area (ha) per household in Haleku by gender

Livestock production

Milk and meat production, cash source (from sale of animal and their products), draft power for threshing and traction are the main purposes of keeping livestock. Different species of livestock are kept by farmers. Livestock species kept by farmers are shown in Figure 3. Average numbers of a given species and % of households that own the species are indicated in Table 2.

Table 2: Uses of livestock species, percent of HH that own the species and average numbers of animals per household in Haleku *kebele*

Livestock species	Haleku Gulenta *kebele*				
	Use	% of HH that own the species		Average number of animal per household	
		Women	Men	Women	Men
Local dairy cow	Milk, butter, cheese, calf crop for sale and manure	77	90	6	6
Improved dairy cows	Milk, butter	33	1	1	1
Draught cattle	Traction, trashing and manure	100	20	2	2
Sheep	Cash source, meat,	10	18		
Goats	Cash source, meat and manure	88	95	10	15
Poultry-Village	Egg, meat, cash source		90	0	7
Donkey	Transportation and threshing	78	12	3	
Horse	Transportation and cart-pulling		1		1

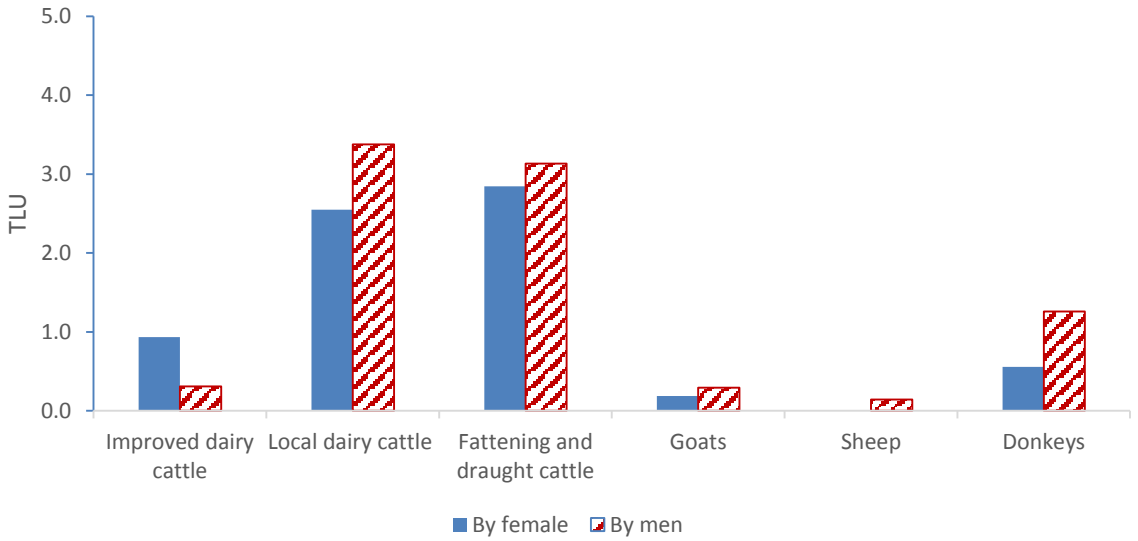


Figure 3: Average livestock species holdings per household in Tropical Livestock Unit (TLU) in Haleku

Local dairy cattle and oxen for draught are the predominant livestock species as soon in Fig. 3. Local dairy cattle, draught oxen, goats and donkeys are owned by at least 70% of all households (Table 2). Poultry are also owned by most households although women added that currently there are no households with poultry due to an outbreak of a disease. (Table 2).

Men mentioned at least 4 micro-finance institutions from which they can obtain credit facilities while women were only aware of 2. Both men and women mentioned that about 55% have access to credit. It is relatively difficult to access credit because the stringent rules and regulations (be a member of a financial institute, proof of land ownership or other assets) are deemed as prohibitive by both men and women.

Farmers sell crop products, livestock and their products and services to get income. The contribution of different income sources in the *kebele* as perceived by women and men is shown in Figure 4 below. Crop production in form of cash crops (wheat, barley, tef), food crops (onion, cabbage, onion, green beans, pepper grown mainly by irrigation) is the dominant source of income according to men, while trading is dominant for women. Milk and milk products from cattle and goat as well as sales of live goats and cattle are common income sources from livestock.

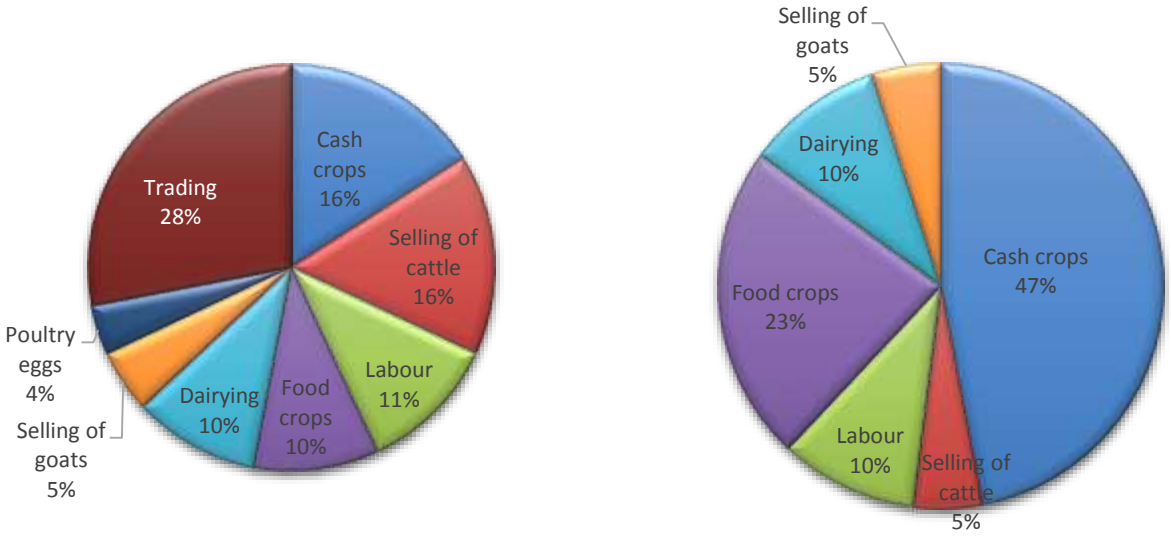


Figure 6: Contribution of livelihood activities to household income (%) in Haleku *kebele* as perceived by women (left) and men (right)

Livestock management

Livestock housing

Structures built from local materials are used to house livestock. Men mentioned that housing is only for small ruminants, calves and cattle which are housed separately. According to women, housing is only for calves and sick animals.

Feeds and feeding

Style of feeding varies depending on season. Combination of stall feeding and tethering are common during cropping season when most farm lands are covered by food crops. There is also a practice of open grazing during dry period after crop harvest. Major feed resources include crop residues from cereal straws and crop aftermath. Purchased feeds are shown in Fig. 5. Wheat bran and noug cake are purchased particularly for milking animals. The only form of processing is chopping. Feed shortage is one of the major impediments for improved livestock production. Availability and quality of feeds varies along different seasons.

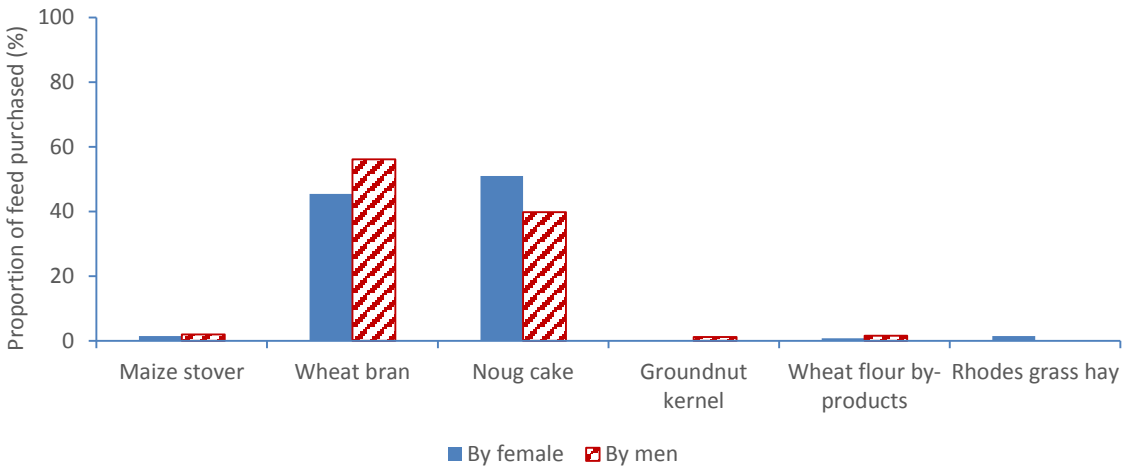
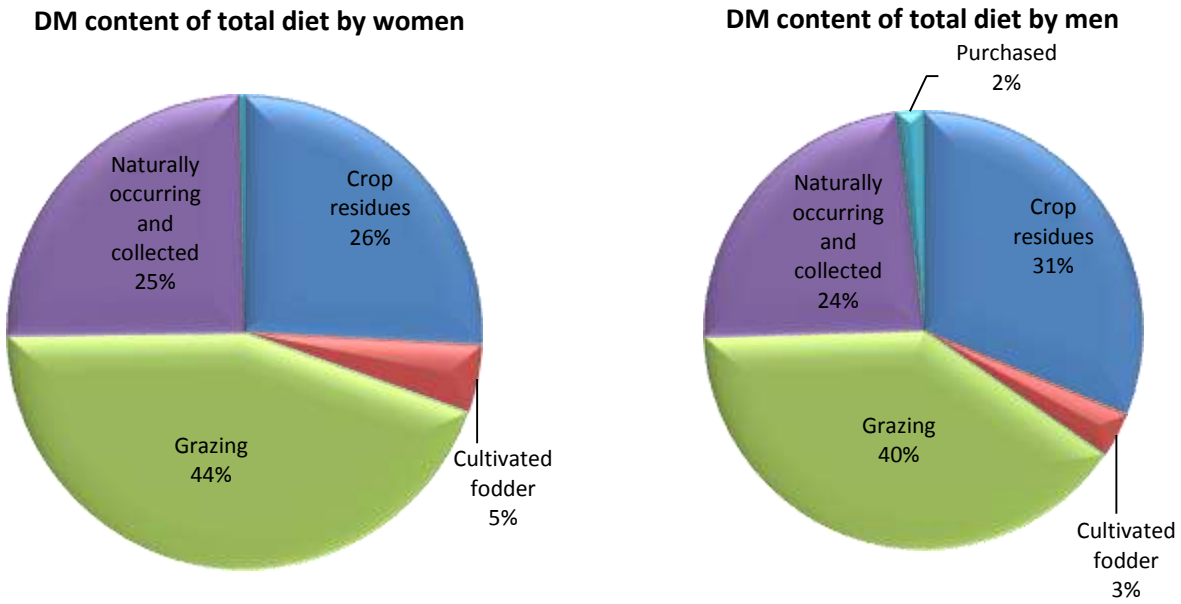
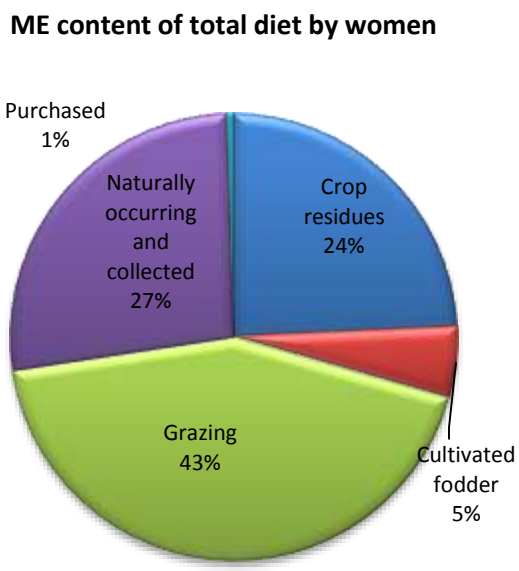


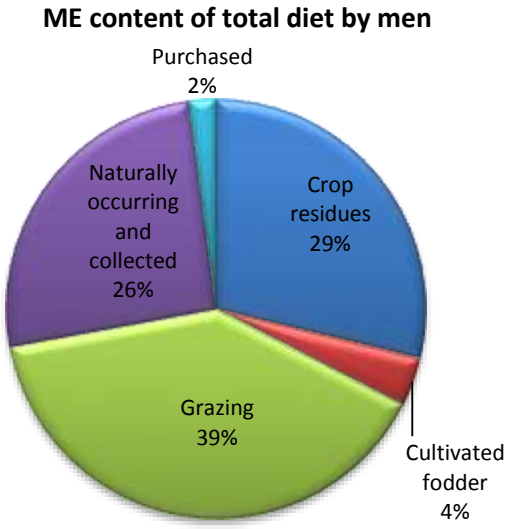
Figure 7: Feed purchased over a 12 months period in Haleku *kebele*

Besides the shortage of feed supply, quality problem is also a critical challenge for improved productivity of livestock. Livestock in the area depends on the existing poor quality feed sources to satisfy their dry matter (DM), metabolisable energy (ME) and crude protein (CP) requirements. Dietary contribution of each feed sources in the two areas have been indicated in Figure 6 below. Crop residues, naturally occurring fodder and grazing are the main sources of dry matter, metabolisable energy (ME) and protein of the total diet of livestock.

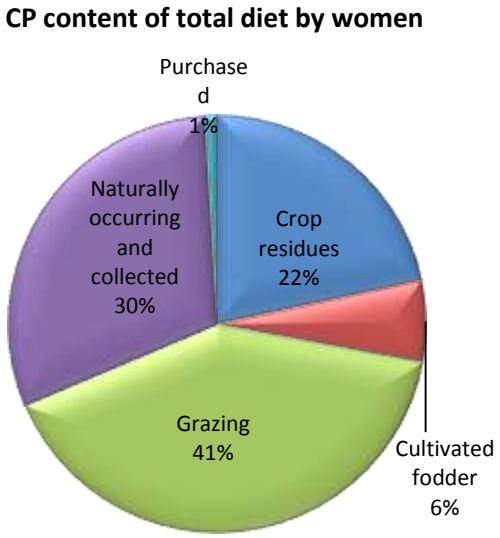


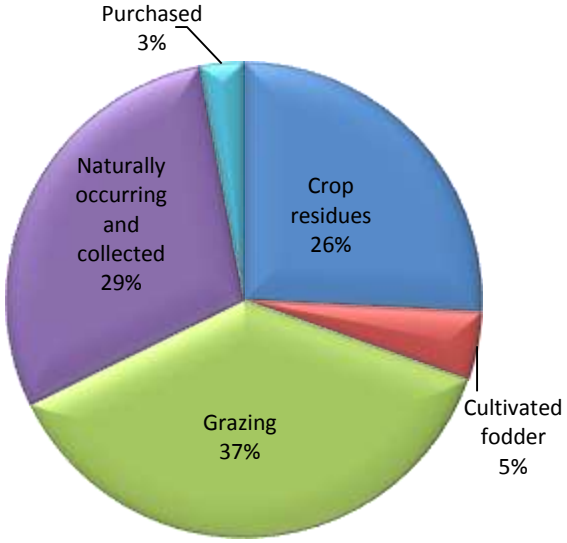
Perceptions of dry matter content of total diet





Perceptions of the metabolizable content of total diet





Perceptions of the crude protein content of total diet by *women*

Figure 8: Dietary compositions of DM (a), ME (b) and CP (c) of the total diet of feeds in Dodicha *kebele*

The composition of the livestock diet in relation to the rainfall pattern is shown in Figure 7. Most of the feed resources are available throughout the year in various proportions with the exception of green fodder that is available during the higher rainfall periods June to October. Both men and women have similar perceptions to the predominant contribution of grazing, crop residues and naturally occurring and collected fodder.

Livestock health management

Common health problems include sheep pox, bloating, anthrax, foot and mouth disease and lumpy skin disease. Farmers travel up to 2km to the veterinary clinic. Service for treatment and vaccinations vary between ETB 50-150, depending on the disease or ailment. Traditional medicine (usually homey) is only used for bloating.

Breeding management

Farmers stated that there is shortage of improved livestock breed specially that of cattle. During the group discussion, farmers expressed their great interest to replace local low producing breeds of cattle with improved one if they would get proper breed improvement service (which currently is very poor). Both artificial insemination and bull services are readily available in the *kebele*, although bull service is endangered due to use of bulls for draught. Artificial insemination is not popular because of the cost (15-30 ETB) and low rates of conception.

Problems, issues and opportunities within the livestock system

Major problems faced by farmers in the *kebele* with reference to livestock production include feed shortage, improved breed shortage, shortage of water, diseases and poor animal health service. Men mention lack of bulls and feed shortage as critical, while women mention feed shortage and shortage of water as the pressing problems. Farmers take different measures as a coping mechanism for some of the existing problems. Main problems, coping mechanisms and suggested solution for each study site have been listed in Table 4.

Table 4: Problems, coping mechanisms and suggested solutions by women and men in Haleku *kebele*

Problems	Ranking		Suggested solution and coping mechanisms by farmers	
	Women	Men	Women	Men
Feed shortage	1	2	Improving palatability of crop residues Plant forage on borders of farms under irrigation	Forage seed to be made available by Research centers, Government
Shortage of water	2	3	Prayer	Provision of water at different points through water pumps
Disease infestation	4	4	Vaccinations	Vaccinations
Lack of veterinary clinics		5	Construction of clinics by the Government	Construction of clinics by the Government
Shortage of improved breeds	3	1	Artificial insemination	Research centers should make improved breeds available

Potential interventions

Crop production is the main source of income in Haleku. However, the sale of cattle and goats has potential to increase incomes of the farmers. Limitations due to feed shortage, diseases and low performing breeds seem to hamper productivity of the livestock. Crop residues and grazing are the main feed resources. Improving the quality of crop residues is paramount to address the problem of feed shortage in the near term. Planting of forages may not be practical only if, as they are planted on borderlines of irrigated land as suggested by women. Forage seed would still remain a constraint. Interventions targeting livestock productivity must aim at integrating both feed availability and quality, health issues and improvement of breeds in sustainable ways.

Conclusions

Farmers are willing to accept for change if they are equipped with technical and financial support. This study clearly points to differences in preferences of men and women. Therefore, it can be recommended that equal representation of men and women are present during assessment, particularly those concerning livestock. Since Haleku is predominantly a crop producing area with a shortage of feed for their livestock, there is potential to integrate crop production and livestock feed supply. ICARDA through the CRP Dryland Systems project of ESA seeks to approach crop residue quality by identifying cultivars and varieties of cereals and legumes in Adami Tullu that have superior traits of both food and feed and incorporating these into the feed rations for fattening bucks, which are eventually sold on the market. The community based breeding programme is targeting selection of bucks for breed improvement with an aim to improve breed productivity of small ruminants especially goats. Improvement of cattle breeds would be a priority area although this is beyond the scope of ICARDA. Thus, there is need to identify other donors/funders who would contribute particularly to improvement of cattle breeds and provision of water.